WHAT IS CLAIMED IS:

1. A robotic surgical tool for use in a robotic surgical system having a processor which directs movement of a tool holder, the tool comprising:

a probe having a proximal end and a distal end;

a surgical end effector disposed adjacent the distal end of the probe;

an interface disposed adjacent the proximal end of the probe, the interface releasably coupleable with the tool holder; and

circuitry mounted on the probe, the circuitry defining a signal for transmitting to the processor so as to indicate compatibility of the tool with the system.

2. The robotic surgical tool of claim 1, further comprising a sterile adapter releasably mounted to the tool holder, the adapter coupling the tool holder to the interface, wherein the circuitry transmits the signal to the processor of the robotic surgical system via the adapter.

3. The robotic surgical tool of claim 1, wherein the signal comprises unique tool identifier data.

4. The robotic surgical tool of claim 3, the processor of the robotic surgical system including programming to manipulate the tool identifier according to a predetermined function so as to derive verification data in response to the tool identifier, wherein the signal transmitted to the processor further comprises the verification data.

5. The robotic surgical tool of claim 1, wherein the signal comprises an identifier signal included in a table accessible to the processor for comparison with the signal, the table comprising a plurality of compatible tool identification signals.

6. The robotic surgical tool of claim 1, wherein the signal comprises an arbitrary compatibility data string.

7. The robotic surgical tool of claim 1, wherein the probe body comprises an elongate shaft suitable for distal insertion via a minimally invasive aperture to an internal surgical site of a patient body.

8. The robotic surgical tool of claim 1, wherein the end effector is adapted for manipulating tissue, and further comprising a wrist joint coupling the end

effector to the shaft for varying an orientation of the end effector within the internal surgical site.

9. The robotic surgical tool of claim 1, wherein the end effector defines a field of view, the probe comprising an image capture device.

10. A robotic surgical component for use in a robotic surgical system having a processor and a component holder, the component comprising:

a component body having an interface mountable to the component holder, the body supporting a surgical end effector;

a drive system coupled to the body, the drive system moving the end effector in response to commands from the processor; and

circuitry mounted on the body, the circuitry defining a signal for transmitting to the processor, the signal comprising at least one member selected from the group consisting of compatibility of the component with the system, a component-type of the component, coupling of the component to the system, and calibration of the component.

11. The robotic surgical component of claim 10, wherein the component comprises a tool including a shaft having a proximal end and a distal end, the end effector disposed adjacent the distal end of the shaft, with a plurality of degrees of motion relative to the proximal end of the shaft, and wherein the interface comprises a plurality of driven elements, and further comprising a tool drive system coupling the driven elements to the degrees of motion of the end effector, the tool drive system having one or more calibration offsets between a nominal position of the end effector relative to the driven elements and a measured position of the end effector relative to the driven elements;

wherein the circuitry comprises a memory storing data indicating the offsets, the memory coupled to the interface so as to transmit the offsets to the processor.

12. A robotic surgical tool for use in a robotic surgical system having a processor which directs movement of a tool holder, the tool comprising:

a probe having a proximal end and a distal end;

a surgical end effector disposed adjacent the distal end of the probe;

an interface disposed adjacent the proximal end of the probe, the interface releasably coupleable with the tool holder; and

circuitry mounted on the probe, the circuitry transmitting a signal via the interface to the processor so as to indicate a tool-type of the tool.

13. The tool of claim 12, further comprising at least one joint disposed between the interface and end effector, the joint defining a joint axis geometry, and wherein the signal indicates the joint geometry of the tool to the processor.

14. The tool of claim 12, wherein the end effector has a strength, and wherein the signal indicates the strength of the end effector to the processor.

15. A robotic surgical tool for use in a robotic surgical system having a processor which directs movement of a tool holder, the tool comprising:

a probe having a proximal end and a distal end;

a surgical end effector disposed adjacent the distal end of the probe;

an interface disposed adjacent the proximal end of the probe, the interface releasably coupleable with the tool holder; and

circuitry mounted on the probe, the circuitry transmitting a signal via the interface to the processor so as to indicate tool calibration offsets of the tool.

16. A method for installing a robotic surgical component in a robotic surgical system, the method comprising:

mounting the component to a component holder;

transmitting a signal from the component to a processor of the robotic surgical system;

articulating the component in response to the signal per commands of the processor.

17. The installation method of claim 16, further comprising verifying compatibility of the component with the robotic surgical system using the signal.

18. The installation method of claim 17, wherein the compatibility verification step comprises:

providing unique identification data on the component;

deriving verification data from the identification data according to an algorithm and storing the verification data in a memory of the component, the signal comprising the identification and verification data;

performing the algorithm on the transmitted unique identification data with the processor and comparing the results with the verification data.

19. The installation method of claim 16, further comprising reconfiguring the commands of the processor in response to the signal.

20. The installation method of claim 19, wherein the signal comprises a component-type of the component.

21. The installation method of claim 20, wherein the signal comprises calibration of the component.

22. A robotic surgical system comprising:

a plurality of tools of different tool-types, each tool comprising an elongate shaft with a cross section suitable for introduction into an internal surgical site within a patient body via a minimally invasive opening, a distal surgical end effector coupled to the shaft by at least one joint, the joint drivingly coupled to a proximal interface by a tool drive system, and circuitry that transmits a tool-type signal via the interface;

a robotic manipulator including a linkage supporting a tool holder which releasably receives the interface, at least one manipulator drive motor drivingly engaging the linkage so as to move the tool holder relative to the opening and position the shaft within the surgical site, and at least one tool drive motor coupled to the tool holder so as to drivingly engage the tool drive system and articulate the at least one joint; and

a processor coupled to the tool holder, the processor having programming that effects a desired movement of the end effector by transmitting drive signals to the at least one tool drive motor of the manipulator, wherein the processor reconfigures the program for the different characteristics based on the tool-type signals.

23. The robotic system of claim 22, wherein the drive systems of the different tool-types effect different angular movement about the joints for a given input from the tool drive motors, and wherein the processor reconfigures the program for the different drive system angular movements.

24. A fault tolerant robotic surgical system comprising:

a surgical tool having a surgical end effector and an interface;

a manipulator assembly having a base and a tool holder for releasably engaging the interface;

a plurality of tool engagement sensors coupled to the tool holder, each sensor producing a tool signal when the interface engages the holder; and

a processor coupled to the tool engagement sensors, the processor having a tool change mode and a tissue manipulation mode, the processor requiring tool signals from each of the sensors before changing from the tool change mode to the tissue manipulation mode, the processor remaining in the tissue manipulation mode when at least one, but not all, of the tool signals is lost.

25. A robotic surgical system comprising:

a manipulator assembly having a base and a tool holder which moves relative to the base, the tool holder having a plurality of drive elements;

a sterile drape covering at least a portion of the manipulator;

a sterile tool having a proximal interface and a distal end effector, the distal end effector having a plurality of degrees of motion relative to the proximal interface, the degrees of motion coupled to driven elements of the interface; and

an adapter disposed adjacent the sterile drape between the holder and the interface, the adapter comprising a plurality of movable bodies, each movable body having a first surface driven by the drive elements and a second surface driving the driven elements.

26. The robotic surgical system of claim 25, wherein the movable bodies are rotatable about an axis between the first and second surfaces, the rotatable bodies movable between first and second axial positions, the rotatable bodies being disposed in the first axial position when the adapter plate is mounted to the manipulator and the rotatable bodies are misaligned with the drive elements, angular rotation of the rotatable bodies being limited when the rotatable bodies are disposed in the first axial position to allow alignment of the drive elements with the rotatable bodies by rotating the drive elements, the rotatable bodies having unlimited angular rotation when the rotatable bodies are aligned with the drive elements and the rotatable bodies are disposed in the

second axial position, and wherein each of the driven elements has a limited angular rotation.

27. A robotic surgical tool for use with a robotic manipulator having a tool holder, the tool holder having magnetically actuatable circuitry, the tool comprising;

a probe having a proximal end and a distal end;

a surgical end effector adjacent the distal end of the probe;

an interface adjacent the proximal end of the probe, the interface releasably coupleable with the holder, the interface comprising a magnet positioned so as to actuate the circuitry of the holder.

28. A robotic surgical system comprising:

a processor;

a tool having a surgical end effector; and

a robotic manipulator coupling the tool to the end effector;

wherein the processor senses coupling of the tool to the manipulator by at least one member selected from the group consisting of:

a signal from a memory circuit of the tool;

a signal from a memory circuit of an adapter coupling the tool to the manipulator; and

a signal from a magnetic switch that is magnetically actuated by a magnet of the tool.

29. A robotic system comprising:

a robotic manipulator having a tool holder, the manipulator moving the holder in response to signals from a processor;

a tool having a surgical end effector;

an adapter coupling the tool to the holder, the adapter maintaining sterile separation between the tool and holder;

a first sensor disposed adjacent the holder, the first sensor transmitting a first signal to the processor in response to coupling of the adapter to the holder; and

a second sensor disposed adjacent the holder, the second sensor transmitting a second signal to the processor in response to coupling of the tool to the adapter.

30. The robotic surgical tool of claim 3, wherein the signal further indicates at least one of tool life and cumulative tool use by a measurement selected from the group consisting of calendar date, clock time, number of surgical procedures, number of times the tool has been coupled to the system, and number of end effector actuations.

31. A robotic surgical system comprising:

a tool having circuitry containing verification information;

a coupler for coupling the tool; and

at least one system processor for receiving the verification information from the tool coupled to the coupler, said at least one processor further manipulating the information with an algorithm to produce output information, comparing the output information to predetermined data to verify compatibility of the tool with the robotic surgical system, and enabling the robotic surgical system to manipulate the tool if the output information matches the predetermined data.

32. The system of claim 31, wherein said verification information and said predetermined data are unique to said tool, and said predetermined data are contained in said circuitry on said tool.